Article

A comparative study of Takaful and conventional insurance: empirical evidence from the Malaysian market

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A comparative study of *Takaful* and conventional insurance: empirical evidence from the Malaysian market

Abstract

The purpose of this paper is to distinguish between the performance levels of the Malaysian *Takaful* and conventional life insurance industries with a view to better informing the decisions of stakeholders. Our analysis makes use of financial ratios and macro-economic variables namely Gross Domestic Product (GDP), Consumer Price Index (CPI) and Treasury Bill Rate (TBR). We use two stage analysis. In the first stage we use discriminant analysis and logistic regression models for the financial ratios as independent variables and a dichotomous dependent variable. In the second stage we use multiple regression to investigate the macro-economic independent variables with net premiums/contributions and net investment income as dependent variables. The data is extracted from companies' annual reports. Our results indicate that conventional insurers perform better than *Takaful* companies in terms of profitability and risk measurement but *Takaful* outperform conventional insurance in respect of premium to surplus ratio. However, *Takaful* companies have prudent underwriting practices in place to curb information asymmetry. Furthermore, our results indicate that, unlike in the case of conventional insurance, the macro-economic variables have no impact on the growth of *Takaful* companies as measured by the net premiums/ contributions. However, net investment income shows statistical significance for both industries. This is indicative of the fact that both industries efficiently utilize their funds to generate the desired return on their investments. Our paper has scholarly implications in terms of the empirical analysis of conventional and Islamic financial institutions – insurance in particular. It can also inform market decisions and public policy with respect to the economic contribution of the insurance industry in Malaysia.

Key words *Takaful*; Conventional insurance; Classification techniques; Malaysian market
Paper type Research paper

1. Introduction

The resilience of the Islamic financial sector to the global financial crisis combined with the relative growth of oil wealth in the Middle East has enabled the Islamic financial industry to grow at an unprecedented rate (Masood *et al*., 2011). According to the president of the Islamic Development Bank (IDB), the total assets of the Islamic financial industry are expected to exceed $1.5 trillion by 2012 (*Arab news*, 27 Jun 2011). As a result, several developed and developing countries across the globe are seeking to provide the industry with a sound regulatory infrastructure and efficient investment opportunities. Southeast Asian countries, such as Malaysia, Indonesia, Singapore, Brunei, Sri Lanka and Bangladesh, are striving to foster Islamic financial institutions in parallel to the existing

conventional financial industry. Among them, Malaysia is a pioneer as a provider of a uniform regulatory infrastructure for the Islamic financial industry (Lim *et al*., 2010).

As a result of government support and capital availability over a period of thirty years, Malaysia has witnessed an unparalleled growth in demand for Islamic financial products and services across the country. Malaysian Islamic banking assets amounted to RM350.8 billion as at the end of 2010, increasing by 15.7% compared to 2009; meanwhile, the *Takaful* sector assets increased by 17.8% from the 2009 figure to RM14.7 billion at the end of 2010. The total assets of the *Takaful* industry account for 8.7% of the total assets in the conventional insurance and *Takaful* industry according to Bank Negara Malaysia (BNM, 2011a). The global *Takaful* contribution was expected to reach $12 billion by the end of 2011 and $25 billion by 2015 (Ernst and Young, 2011). The global growth in the industry is mainly concentrated in the Middle East and North Africa and Southeast Asia. Based on 2009 figures, Saudi Arabia is the leading country with a total contribution of $3.86 billion, followed by Malaysia with $1.15 billion and the United Arab Emirates with $640 million (Gulf News, 21 July 2011).

The Malaysian Takaful industry: according to the BNM (2011a) financial stability report, total income from family *Takaful* policies increased by 20% to RM4,030.2 million in 2010 from RM3,381.6 million in 2009. This contributed to the increase in net contributions to family *Takaful*, which rose to RM3,326.9 million in 2010 from RM2,719.8 million in 2009. The net investment income from family *Takaful* exhibited a similar growth level rising to RM451.6 million in 2010 from RM354.8 million in 2009. However, due to tough market conditions at the global level, general *Takaful* recorded a slight decline in its underwriting profit in 2010, to RM145.8 million from RM170.1 million in 2009. Although the overall operating profit for *Takaful* providers in Malaysia improved from RM247.5 million in 2009 to RM272.4 million in 2010, due to relatively high operating costs, the overall profit declined. However, investment income for general *Takaful* still enjoyed an increase from RM57.7 to RM67.9 million in 2010.

According to BNM Deputy Governor (BNM, 2011b), the *Takaful* industry in Malaysia penetrated relatively faster than expected between 2005 and 2010 achieving a growth rate of 28% in 2010. There is a huge potential market for the *Takaful* industry, with only 54% of the population having either life insurance or family *Takaful* while the rest remain

uncovered. At present, there are nine *Takaful* operators with an asset base of RM14,691.1 million and a total net contributions income of RM4,406.0 million, which is 6% of total Malaysian GNI (BNM, 2011c). Table 1 provides a snapshot of the Malaysian *Takaful* industry. The successful track record of the *Takaful* industry notably the growth in local demand is attributable to the growth of various components of the Islamic financial system, especially the Islamic banking sector and the Islamic capital market (Salleh & Kamaruddin, 2011).

TABLE 1 HERE

The Malaysian conventional insurance industry: according to BNM (2011d), the conventional insurance industry earned a total premium income of RM31,923.9 million in 2010, an increase from RM29,208.2 million in 2009. As of the end of 2010, the industry had a recorded asset base of RM166,193.6 million, which comprises 5.5% of the total assets of the Malaysian financial industry, as shown in Table 2.

TABLE 2 HERE

Former Life Insurance Association of Malaysia (LIAM) president Md Adnan Md Zain reported in 2010 that group insurance is seeing an upward trend. The group insurance business saw a growth of 14.1% to a record RM2.36 billion in total premiums in 2010 compared to RM2.07 billion in 2009 (The Malay Mail, 11 April 2011). Similarly, the life insurance industry in Malaysia enjoyed a positive growth of 11.9% in 2010, as measured by total new business premiums, which were RM8.42 billion in 2010 compared to RM7.53 billion in 2009. This growth can be attributed to investment-linked policies, which showed a 26.6% growth over the same period. The growth in investment-linked business came from annual premium business (LIAM, 2010).

Currently, the *Takaful* industry in Malaysia faces strong competition from the established conventional insurance industry in several key areas. The lack of an adequate secondary market for *Shari'ah*-compliant investment uniform regulatory infrastructure and a lack of research are some of the key issues hindering effective product development in the industry (Redzuan *et al*., 2009). For *Shari'ah* compliant *Takaful* companies, many conventional profitable investment opportunities are not permitted under the divine laws

of Islam (Samad, 2004). However, the impact of these constraints could be overcome by accelerating research in order to provide alternative investment avenues for the *Takaful* industry that are *Shari'ah* compliant. Due to the increase in the number of *Takaful* companies since 2005, considerable research is being carried out to enable the industry to structure and offer more innovative products and services than ever before. However, the industry still needs more research in order to develop the business potential of the Malaysian market (Mondaq News, 04 July 2011).

In order to appraise the performance of non-financial and financial enterprises, financial ratios are widely used including by way of comparison of Islamic and conventional banks (e.g. Samad, 2004; Iqbal, 2001; Johnes *et al*., 2010). The conventional insurance industry has been researched extensively using financial ratios, as is evident, for example, in the work of Amel *et al*. (2003), Chen & Wong (2004) and Franklin *et al*. (2005). However, there remains the opportunity to pursue the comparison between conventional insurance with the *Takaful* industry in terms of financial ratios, for the case of Malaysia, which is presently the second largest *Takaful* market after Saudi Arabia.

Research into the performance of the insurance industry is crucial not least in the face of the industry's many challenges, which include increased competition, consolidation, solvency risks and a changing regulatory environment (Saad and Idris, 2011). Researchers have been attracted by the growth of the *Takaful* industry in parallel with the conventional insurance industry in Malaysia (e.g. Hamid *et al.* 2009; Rahman *et al.*, 2004; Rahman *et al.*, 2008; Redzuan *et al.*, 2009). Their work seeks to identify any relationship between macro-economic variables and the demand for family *Takaful* in Malaysia. They also investigate how far the emergence of *Takaful* institutions has had a positive social impact in Malaysia, as measured by economic indicators. It can be concluded from their findings that since its inception in 1984 the *Takaful* industry has had a healthy impact on the socio-economy of the country. This can be seen in the growth of employment, profits before tax, and charitable giving by way of tithes (*Zakah*). These researchers also find that Islamic life insurance is much more popular among the Malaysian Muslim population in general, as compared to conventional life insurance, because of its *Shari'ah* compliant attributes including the general perception that conventional insurance is un-Islamic because of the elements of *Riba* (interest), *Maysir* (gambling), and *Gharar* (excessive risk) (Lim *et al*., 2010).

A recent empirical investigation by Ismail *et al*. (2011) uses a sample of nineteen firms to examine whether there are any significant differences in efficiency between *Takaful* and the conventional insurance industry. Their findings indicate that significant differences exist. On the basis of Constant Return to Scale (CRS) and Variable Return to Scale (VRS) tests, they find that the *Takaful* industry is less efficient than conventional insurance. They obtain similar results when conducting Pure Technical Efficiency (PTE) and Scale Efficiency (SE) tests. Their work shows that the *Takaful* industry still needs to grow in order to benefit from scale efficiency. It is clearly beneficial to investigate other indicators at the same time as addressing a more recent period.

The literature shows, to the best of our knowledge, that no other researcher to date has investigated the differences between the *Takaful* and conventional life insurance industries in Malaysia based on financial ratios using discriminant and logistic regression. Furthermore, these two industry sectors have never been empirically investigated in order to measure the impact of macro-economic variables on their performances. In summary, the contribution of the present paper consists in its pursuit and achievement of two objectives: firstly to distinguish *Takaful* from conventional life insurance companies in terms of key financial metrics; and secondly to investigate how far, if at all, macro-economic variables, namely Gross Domestic Product (GDP), Consumer Price Index (CPI) and Treasury Bill Rate (TBR), appear to influence the growth of the *Takaful* and conventional insurance industries respectively in Malaysia. Our findings are intended in practical terms to identify how far and in which respects the performance of the *Takaful* industry differs from that of conventional insurers with respect to profitability and solvency. The rest of this paper is organized as follows: section 2 reviews the underlying concepts; section 3 addresses data sources and methodology; section 4 reports and analyses our results; and section 5 comprises conclusion and recommendations.

2. Conceptual and structural differences between *Takaful* and conventional insurance

Takaful operators and mainstream conventional insurers differ in terms of their essential conceptual paradigms (see for example Kwon, 2007; Kwon, 2010; Lee *et al.* 2010; Hussain and Pasha, 2011; Maysami and Kwon, 2011; Abidin *et al.* 2012). Mainstream conventional insurance comprises an undertaking by an insurer in exchange for consideration to make a payment to either the insured or another if a specified event

occurs. *Takaful* is Islamic alternative to conventional insurance and is based on the notion of 'social solidarity, cooperation and joint indemnification of losses of the members'. Within risk management it can serve to hedge against the risk of a contingent loss and can replace the risk of a large possible devastating loss with a small contingent loss. Aspects of mainstream insurance are generally held to be structurally contrary to Islamic *Shari'ah* principles notably the following. It is contrary to reliance on Allah's will by avoiding risk, because Muslims believe that what happens is predetermined by His will. They are allowed however to take steps to minimize the impact of events. What then is specifically objectionable in conventional mainstream insurance? It is a commutative contract which unduly limits uncertainty and ambiguity. It entails *Riba* (prohibited interest), *Gharar* (inordinate risk and insufficient transparency), *Maysir* (gambling), and investing in prohibited activities such as alcoholic beverage production. Conventional insurance is furthermore considered *Haram* (prohibited) because the insurers pay for a loss of human life which is priceless and they aim to generate a profit for their stakeholders not whom they are insuring. *Takaful* is a contract of mutual guarantee based on mutual co-operation and gratuitous offering in which risk is assumed voluntarily by participants in the *Takaful* pool/contract. Based on these differences it is of interest to examine whether there are differences in performance and financial strength between *Takaful* and standard insurance companies in Malaysia.

The above religious imperatives have generated a wide range of *Shari'ah* compliant institutions including *Takaful* which is the focus of the present paper. The word insurance or banking when prefixed by 'Islamic' means that all theories and practices are examined from the perspective of Islamic laws and values as enshrined in the *Qur'an* (holy book) and *Hadith* (sayings of prophet Muhammad, peace be upon him) (Farooq *et al*., 2010). The concepts of *al-diyah* and *al-aqilah* (blood money to rescue an accused in accidental killings) gave birth to the concepts of *Takaful*. In Arabic, *Takaful* means 'joint guarantee', which can be further defined as an agreement among a group of members or participants who are willing to mutually guarantee one another against potential future losses to their respective assets (Rahman *et al*., 2008). The core of the *Takaful* concept is the aim to promote mutual cooperation, solidarity and brotherhood in the community. Islam prohibits *Riba*, *Gharar* and *Maysir* in either commercial or social contracts. Islamic scholars such as Ibn Abdin (1784-1836) first started to examine whether conventional insurance is in accordance with the tenets of Islam (Anwar, 1994). Ibn Abdin (cited by

Farooq *et al*., 2010, p. 57) argues that "I see that it is not permitted to any merchant to get indemnity for his damaged property against the payment of a certain sum of money known as insurance premium; because this is a commitment for what should not be committed to". Ibn Abdin denounced the contract of insurance because the elements of *Gharar* and *Maysir* were inherent in it.

The differences between *Takaful* undertakings and those of conventional insurers are identified in the Islamic Financial Services Board's (IFSB) Guiding Principles:

(i) *Takaful* undertakings are generally structured as "hybrids" between mutual and proprietary entities; thus, they may face various conflicts of interest that ordinarily would not arise in conventional insurance,

(ii) *Takaful* undertakings must adhere to the core principles of *Ta`awun* (cooperation) and *Tabarru'* (donation) and the prohibition of *Riba* and

(iii) an inherent component that adds value and differentiates between *Takaful* undertakings and those of conventional insurers is the sharing of risks among the *Takaful* participants, rather than the transfer of risks from the participants to the *Takaful* operator. This becomes part of the rationale for the practice of creating a separate account for underwriting activities on behalf of the *Takaful* participants, while the shareholders in *Takaful* operators will not bear any responsibility in the event of a deficit or loss suffered by the *Takaful* fund, other than having in place a *Q'ard* (voluntary loan) facility to enable the Participants' Risk Fund (PRF) to meet its obligations in the event of a deficiency. However, the capital of the *Takaful* operators is exposed in extreme cases where the PRF suffers a loss on such a scale that the *Q'ard* once made cannot be recovered from contributions over any reasonable period (Redzuan *et al*., 2009).

In summary our journey begins with the incompatibility between a conventional insurance contract and the exigencies of a Shari'ah compliant contract, such as Takaful. This conceptual incompatibility substantiates our hypotheses to the effect that economic and financial differences between Takaful and conventional insurance lead to distinguishable financial performances. Given the theoretical analysis in the previous section and the above conceptual distinction, what essential differences emerge with respect to expected performance and financial strength between *Takaful* and conventional insurers in Malaysia? This question occupies the present paper.

3. Research methodology

3.1. Data collection

The sample comprises twelve companies, six from conventional and *Takaful* undertakings respectively. A total of nine *Takaful* operators could be identified in Malaysia as of 2010, but three were excluded as they had operated in the industry for a very short period, and thus there is insufficient data for them. Similarly, in Malaysia's conventional insurance industry there were 38 insurers in total, at the time of the research, excluding re-insurance companies. However, only those insurers offering both life and general insurance services similar to those of *Takaful* operators in size (i.e. total assets) have been included in our sample, in order to avoid sample bias.

Due to the inaccessibility of the data and the relatively small number of *Takaful* operators in Malaysia before our following commencing date, a period of six years, from 2005 to 2010, is chosen. All of the data are extracted from the respective companies' annual reports which are produced in accordance with the Malaysian accounting and auditing standards namely the original audited financial statements. These are in line with international standards and disciplines (World Bank, 2012). There are some gaps in the data for some of the selected companies, either due to late entry into the market or because they have not yet published the required data. Having selected twelve companies over a period of six years, there is a total of 72 year observations for the *Takaful* and for the conventional insurance companies. A total of thirteen predictor variables (financial ratios) are taken or calculated from the annual reports, in addition to the three macro-economic variables identified previously.

3.2. Distinguishing between *Takaful* and conventional insurance

3.2.1. Variables

Thirteen financial ratios are calculated initially, under three categories, profitability, solvency and efficiency. However, due to multicollinearity, seven financial ratios are finally selected, falling under two categories, profitability and solvency, in addition to our dichotomous/binary dependent variable to distinguish the performance of the two industries measured by financial ratios. Table 3 lists the original and finally selected variables. The ratios eventually used are explained in detail below.

Profitability ratios: there are several ratios that measure the profitability of insurance companies, but this paper uses the following four ratios in accordance with large majority of the literature:

1. Return on assets (ROA) = profit after tax / total assets
2. Return on equity (ROE) = profit after tax / equity capital
3. Investment income ratio = investment income / premium earned
4. Net claims incurred / net contribution.

ROA and ROE are measures of managerial efficiency. ROA determines how a financial institution converts its assets into net earnings while ROE measures the net earnings per unit of investment committed by the shareholders. The higher the ratios, the better is the performance of the company's management and its financial position. The investment income ratio measures how well the company invests its premiums or contributions in order to generate more income. A higher ratio is an indication of management's ability to utilize its surplus funds efficiently. Net claims incurred to net contribution examines the level of actual claims being paid out by the insurers or *Takaful* operators out of the net premiums or contributions they receive from the policyholders. A lower ratio in this case would represent a lower risk exposure and more profitable business (see for example, Samad & Hassan, 1999).

Solvency ratios: there are several ratios used in the insurance industry to measure the solvency status of a company, but this paper examines the following three ratios in accordance with large majority of the literature:

1. Premium to surplus ratio (f) = premium written / surplus (family/life)
2. Premium to surplus ratio (o) = premium written / surplus (overall industry)
3. Total assets / total net contributions (premiums written)

Premium to surplus (f) measures the level of capital surplus required to write premiums. An insurance company must have an asset-heavy balance sheet to pay out claims. The industry statutory surplus is the amount by which assets exceed liabilities. For instance, a ratio of 95% means that insurers are writing £0.95 worth of premiums for every £1 of surplus. A ratio of 102% means that insurers are writing £1.02 for every £1 in premiums. A lower ratio in this case is indicative of a company having greater financial strength. This ratio is calculated twice. First, we measure life/family insurance/*Takaful* in order to

see how these two sectors in the two industries are performing. The second ratio incorporates general/life insurance, in order to measure the overall performance of the two industries. Total assets to total net contribution ratio examines the size of insurance company's capital relative to the premiums written. This takes into account the net premiums written as a measure of solvency rather than the total amount insured, because the level of premiums is linked to the likelihood of claims. It is a basic measure of the financial soundness of an insurer. A higher ratio indicates a more solvent business.

TABLE 3 HERE

In order to compare conventional insurance with *Takaful* on the basis of the financial ratios, an independent *t*-test is conducted using SPSS 17. This test has been used in a similar way by several other researchers including Samad & Hasan (1999) and Samad (2004), to evaluate financial institutions' performance. It allows us to test the equality of variances (Leven's test) and the *t*-values for equal variances. It serves to compare mean scores in continuous variables, for two different groups of participants. The economic and financial structural difference between Takaful and conventional insurance, set out in sections 1 and 2 (see for example, Soekarno and Azhari, 2009; Redzuan *et al.* 2009), provides a clear theoretical driver for our first hypothesis concerning the Malaysian market, namely as follows:

H_1: Financial ratios can distinguish between the performance of conventional insurance companies and *Takaful* operators in Malaysia.

3.2.2. Proposed statistical techniques

In order to distinguish between *Takaful* and conventional insurance, we use two different statistical modelling techniques, namely discriminant analysis and logistic regression using SPSS 17 and STATGRAPHICS 5.

Discriminant analysis (DA): this involves deriving a variate, which is the linear combination of two (or more) independent variables (see for example, Soekarno & Azhari, 2009). Our independent variables are the financial ratios of the *Takaful* and conventional insurance industries in Malaysia. Discrimination is achieved by calculating the variate's weight for each independent variable so as to maximize the differences

between the groups. The variate for discriminant analysis, also known as the discriminant function, is derived from the following form:

$$Z_{jk} = \alpha + W_1X_{1k} + W_2X_{2k} + \ldots + W_nX_{nk} \quad \ldots (1)$$

where,

Z_{jk} refers to the discriminant z-score of discriminant function *j* for object *k*; α is the intercept; W_i is the discriminant weight for independent variable *i*, and X_{ik} is the independent variable *i* for object *k*. An advantage of DA is that the OLS estimation procedure can be implemented to estimate the coefficient of the linear discriminant function, whereas the maximum likelihood method is required for the estimation of logistic regression models. Another advantage of DA over logistic regression is that prior probabilities and misclassification costs can easily be incorporated into the DA approach. At the same time, LR found to be more precise in providing more accurate classification results.

Logistic regression (LR)*:* referred to as LOGIT, this is a specialized form of regression that is formulated to predict and explain a binary (two-group) categorical variable rather than a metric-dependent measurement (see for example, Ong *et al*., 2011). The LOGIT equation takes the following form:

$$\ln\left[\frac{p}{1-p}\right] = \alpha + \beta_1X_1 + \beta_2X_2 + \ldots + \beta_nX_n \quad \ldots(2)$$

where,

p shows the probability from zero to one, while α *a* is the intercept term and β_i represents the slope coefficient in the estimated logit model.

3.3. Effect of macro-economic variables

In order to advance the work of Rahman *et al*. (2008) we additionally attempt to measure the impact of macro-economic variables on the growth of the *Takaful* and conventional insurance companies (see also Beck & Webb, 2003). For this purpose, we used annual data on the Gross Domestic Product (GDP), Consumer Price Index (CPI) and Treasury Bill Rate (TBR) for the period from 2005 to 2010 as independent variables obtained from

the Department of National Statistics Malaysia, 2011 and BNM annual report, 2010. While these macro-economic variables are the independent variables, the growth of the *Takaful*/conventional insurance industry is measured by two dependent variables namely total net contributions to premiums and net investment income. The data for the dependent variables are taken from the conventional insurance and *Takaful* companies' annual reports.

The multiple regression model is designed to measure the relationships between the macro-economic variables (GDP, CPI, and TBR) as explanatory variables, and net premiums to contributions and net investment income as dependent variables as shown below. Having the dependent variables data in absolute figure while the independent variables data in percentage, therefore, log has been run on the dependent variables to avoid potential processing error in the SPSS 17 and/or STATGRAPHICS 5. Furthermore, to satisfy the linearity assumption of the regression model the logarithms of the dependent variables have been used.

Empirical models:

Net premiums/contributions $= a_0 + a_1 \text{GDP} + a_2 \text{TBR} + a_3 \text{CPI} + e_t$ … (3)

Net investment income $= a_0 + a_1 \text{GDP} + a_2 \text{TBR} + a_3 \text{CPI} + e_t$ … (4)

Further to our discussion in sections 1 and 2, the theory which drives our H_2 (see for example Rahman *et al*., 2008; Baharul-Ulum and Yaakob, 2003; Chang, D. H., 1995) argues essentially that *Takaful* has a healthy impact on the socio economy of a country. For example in the case Malaysia, GDP is potentially a good predictor of the demand for *Takaful*. Similarly the other macro economic variables which we have been able to use, namely TBR and CPI, within the range of data availability have also been found to be potentially significant (see for example, Rahman *et al*., 2008; Chang, D. H., 1995). Consequently, we submit the following hypothesis:

H_2: There is a significant relationship between the macro-economic variables, namely GDP, CPI and TBR, and the performance of the *Takaful* operators and conventional insurance companies, as measured by net contribution to premiums and net investment income.

4. Findings and discussion

According to the descriptive statistics in Table 4, the mean ROA for the *Takaful* industry is negative (-0.001) while that for the conventional insurance industry is positive (0.01), and the difference is statistically significant at the 95% confidence level. This indicates that the conventional insurance industry has better financial performance and managerial efficiency than the *Takaful* industry. This is supported by the results for the ROE, which has a mean of 0.35 for the conventional insurance industry but a mean of 0.01 for the *Takaful* industry, with a statistically significant difference at the 99% confidence level. This furthermore suggests that the conventional insurance companies more efficiently deploy shareholders' capital. The results can also be attributed to certain other factors such as those indicated by Islamil *et al*. (2011) who argue that organizational form impinges on efficiency in particular when comparing *Takaful* operators with conventional insurance companies in Malaysia.

Our results for the claim ratio are consistent in that there is a rather high mean of 0.63 for the conventional insurance industry and a mean of 0.49 for the *Takaful* industry with a statistically significant difference at the 95% confidence level. The relatively high claim ratio is indicative of the fact that the conventional insurance industry experiences high liquidity constraints (Akhtar, 2010). Our results are consistent with the findings of Rahman & Daud (2010) who argue that Islamic insurers in Malaysia seem to be carrying out prudent underwriting, which minimizes information asymmetry and leads to sustainable claims. The high claim ratio in the conventional insurance industry can also be attributed to the losses suffered by the Malaysian general insurance sector in 2007/08. According to LIAM (2010) for every RM 1 of motor insurance premiums collected in 2007, insurers spent RM 1.14 on paying claims and on the costs of acquiring and managing the business, and this figure rose to RM 1.21 in the first half of 2008. However, looking at the overall profitability performance, it can be argued that the conventional insurance industry outperforms the *Takaful* industry in Malaysia. This result is consistent with the findings of Ismail *et al*. (2011) who argue that as a result of higher technical and scale efficiencies conventional insurers perform better than *Takaful* operators. However, we find that the investment income ratio, which also measures profitability, has a higher mean (0.05) for the *Takaful* industry than for the conventional insurance industry (0.04) but here the difference is not statistically significant.

The solvency of the two industries is measured using premium to surplus ratio (f), premium to surplus ratio (o) and assets to premium ratio. The descriptive statistics indicate that premium to surplus (o) is considerably different for the *Takaful* and conventional insurance industries. As shown in Table 4, the mean for *Takaful* insurance is 34.00 compared to 4.00 for conventional insurance, and show statistical significant differences at the 90% confidence level. This high mean for *Takaful* could be due to the fact that *Takaful* insurers concentrate, as part of their businesses, on general insurance more than conventional insurers do. In fact, the results are inconsistent with the findings of Yusop *et al*. (2011) who argue that *Takaful* operators are more efficient than conventional insurance in terms of risk management in Malaysia. A contrary result appears for the asset to premium ratio which is 4.31 for the *Takaful* industry and 6.06 for the insurance industry. The difference is statistically significant at the 95% confidence level. This suggests that conventional insurance companies are financially sound and can more efficiently meet potential future claims than *Takaful* operators can. The higher mean is indicative of the fact that conventional insurance companies in Malaysia maintain a sounder capital base than *Takaful* operators. The results are consistent with the findings of Ernst and Young (2011) who argue that *Takaful* operators in Malaysia have higher underwriting leverage, as a result of less equity when compared to conventional insurers and limited solvency requirements. Only one ratio, namely, premium to surplus (f), is not statistically significantly different for the two industries.

TABLE 4 HERE

4.1. Distinguishing between *Takaful* and conventional insurance

Discriminant analysis (DA)*:* this model is used to assess whether the selected financial ratios are able to distinguish between the *Takaful* operators and the conventional insurance companies. Table 5 summarizes the stepwise discriminant analysis[1] results, showing that the overall model is statistically significant at the 99% confidence level. The results allow us to conclude that financial ratios can distinguish between the performance of conventional insurance companies and *Takaful* operators in Malaysia. Thus hypothesis H_1 which states that 'Financial ratios can distinguish between the performance of

[1] We have also applied discriminant analysis using all seven financial ratios, and found that the overall model was statistically significant at the 99% confidence level. The overall model classification accuracy was 82%, with 91.30% and 74.10% for the conventional and *Takaful* operators, respectively.

conventional insurance companies and *Takaful* operators in Malaysia' can be accepted. The results are also consistent with the findings of Soekarno & Azhari (2009) who argue that DA discriminates significantly between the good performance of joint venture general insurance companies and those not performing well in the Indonesian insurance industry.

TABLE 5 HERE

DA furthermore shows that there are four variables, namely investment income, assets to premium, premium to surplus (f) and ROE that significantly distinguish between *Takaful* operators and conventional insurance companies in Malaysia. Our model further reveals that Wilks' Lambda statistical value of 0.883 for the investment income ratio is the highest among the variables, in terms of differentiating between the performances of the two industries, as shown in Table 5.

In order to strengthen the results obtained from the stepwise DA, a summary of the discriminant function is provided in Table 5. This provides more detail regarding the contribution that the independent variables make to the dependent variable. The canonical correlation is 64.2%, which indicates that there is a 64.2% contribution towards the dependent variable from the four independent variables. This further strengthens the earlier stepwise test, showing that those four variables powerfully distinguish the performance of *Takaful* operators and conventional insurance companies in Malaysia and are a valid means of distinguishing between the performances of the two industries.

Furthermore, based on this function we can say that variables with higher coefficients have a more strongly positive relationship to the performance levels of the conventional insurance companies and *Takaful* operators, while those with lower or negative coefficients have a negative relationship. In terms of canonical discriminant function coefficients, ROE has the highest positive value of 1.372 while the investment income ratio has the most negative value of -21.695. Thus, the following discriminant function can be established:

Z-scores = 1.372 ROE – 21.695 investment income + 0.139 premium to surplus (f) + 0.235 asset to premium … (5)

Using the Z-score, we can determine whether an industry's performance level can be classified as good or not. The function at group centroids will be used to calculate a cut-off value between good and bad performance. Our analysis reveals that the function at group centroids is 0.888 for conventional insurers and -0.756 for *Takaful* operators. Taking the cut-off value to be the mid-point of these, we can say that a group with a Z-score above zero will be classified as performing well, while a group with a Z-score below zero will be classified as performing badly.

In order to measure whether the Z-score results given above are accurate, a predicted group membership test is conducted. The primary purpose of this test is to measure the reliability of the above discriminant function. The results in Table 6 show that an overall average correct classification rate of 83.9% is achieved, with 81.48% and 68.21% correct classifications for *Takaful* and conventional insurance respectively. This further supports hypothesis H_1.

TABLE 6 HERE

Logistic regression (LR)*:* a stepwise logistic regression[2] is conducted to identify the ratios that distinguish *Takaful* operators and insurance companies in Malaysia, and to provide a comparison to the DA results. To assess the model fitness, we conduct omnibus tests of the model coefficients. Our results in Table 7 show that the *P*-value for LR model is less than 0.01, meaning there is a statistically significant difference between the variables at the 99% confidence level. Based on our results in this subsection, we accept hypothesis H_1 which asserts that the selected financial ratios are able to distinguish between conventional insurance and *Takaful* operators in Malaysia. This also supports our results applying discriminant analysis.

TABLE 7 HERE

[2] We also ran the logistic regression using all seven financial ratios; the overall model was statistically significant at the 99% confidence level. It is worth mentioning that similar classification results were found when applying this model.

Table 6 shows classification results produced by the LR model which further demonstrate the accuracy of our results. Our results show that 91.30% and 88.90% of the conventional insurers and *Takaful* operators respectively are correctly classified, while the overall average correct classification rate is 90.00%. This overall accuracy rate suggests that LR is a more reliable than the DA technique for evaluating the performance of Islamic and conventional insurers using financial ratios. The model further shows how far the independent variables enable us to distinguish between the performances of the two industries. Only the investment income ratio has a highly positive coefficient, although the effect of the premium to surplus ratio (o) is also positive. All other variables have a negative effect. The resulting equation for the LR model is as follows:

$Logit_i$ = 39.06 investment income – 0.518 assets to premium – 0.447 premium to surplus (f) – 25.56 ROE – 10.99 claim ratio + 0.064 premium to surplus (o) … (6)

4.2. Effect of macro-economic variables

In this section, three regression models are run. Firstly, net contributions are used as the dependent variable for both *Takaful* and conventional insurance operators separately. Secondly, net investment income is used for both *Takaful* and conventional insurance companies. Finally, we combine *Takaful* and conventional insurance operators into one sample, and then run each of the two models again on this combined sample.

Taking macro-economic variables as the explanatory variables, and net contributions as the dependent variable, we find that the *Takaful* model is not statistically significant and that none of the explanatory variables namely Gross Domestic Product (GDP), Consumer Price Index (CPI) and Treasury Bill Rate (TBR) is significant. By contrast, the conventional insurance regression model is significant at the 90% confidence level. Also, the coefficients of GDP and TBR show a statistical significance at the 90% confidence level; GDP is positively correlated to net contributions while TBR is negatively correlated. Therefore, it can be concluded that none of the macro-economic variables influences the growth of the *Takaful* industry as measured by net contributions, whilst GDP and TBR have positive and negative effects respectively on the net contributions of conventional insurance operators.

In fact, this result is consistent with the study of Redzuan & Yaakob (2004) who argue that conventional life insurance in Malaysia is a luxury good and, therefore, is positively related to economic growth. However, our findings for *Takaful* operators are inconsistent with the study of Rahman *et al*. (2008) who argue that a statistical significance exists between the demand for family *Takaful* as measured by net contributions, and the economic variables of GDP, CPI and TBR. The results are also inconsistent with the findings of Redzuan *et al*. (2009) who argue that income *per capita* (measured by GDP) is a robust predictor of family *Takaful* demand (measured by net contributions), while the long-term interest rate and composite stock index have significant relationships with family *Takaful* consumption. However, we assume that, even if there is no statistical significance between the macro-economic variables and the *Takaful* performance indicators, the demand for *Takaful* products is still likely to be growing because of the high public awareness of *Takaful* products and their benefits in Malaysia (see for example Rahman *et al*., 2008).

TABLE 8 HERE

The insignificance of the *Takaful* industry model (and by contrast the significance of the conventional insurers' model) can be explained as follows: the *Takaful* industry has lower technical and scale efficiencies than the conventional insurance industry in Malaysia. Thus, since the *Takaful* industry is operating at a relatively smaller scale than the conventional industry in Malaysia, this could explain the insignificance of the model, as is evident from the findings of Ismail *et al*. (2011) and Saad *et al*. (2006). Thus, for *Takaful*, hypothesis H_2 which states that 'there is a significant relationship between the macro-economic variables, namely GDP, CPI and TBR, and the performance of the *Takaful* operators and conventional insurance companies, as measured by net contribution to premiums and net investment income' is rejected. By contrast, hypothesis H_2 can only be accepted for the conventional insurance industry.

TABLE 9 HERE

As shown in Table 9, unlike the net contribution models, the net investment income regression models for both the *Takaful* and the conventional insurance industry are statistically significant at the 95% and 99% confidence levels respectively. Two of the

macro-economic indicators, namely GDP and TBR do influence the *Takaful* industry at the 90% and 95% confidence levels respectively. On the other hand, GDP considerably influences the net investment income of the conventional insurance industry at the 99% confidence level. Thus the positive relation between GDP and the net investment income variable shows that an upward trend in the general economy will yield better returns on the investments of both *Takaful* and conventional insurers. Our results are arguably consistent with the findings of Ernst and Young (2011) who find that conventional insurers have produced significantly better results than their *Takaful* counterparts in Malaysia, based on their investment returns.

However, besides economic growth there seem to be other explanatory variables influencing investment income, as is evident from the relatively low R^2 value (0.39), which shows that only 39% of the change in the value of the dependent variable is explained by the independent variables. The impact of other explanatory variables on investment income in the Malaysian insurance industry can be explained by the findings of Saad *et al*. (2006) who, taking investment income as a measure of efficiency, argue that the size of the company has an effect on efficiency. This gains some support from the findings of Ismail *et al*. (2011) who argue that conventional insurers have higher scale efficiencies than *Takaful* operators in Malaysia and are, therefore, better equipped to utilize their resources efficiently. Based on our statistical results H_2 can be accepted to the effect that a relationship does exist between macro-economic variables and the performance of both the *Takaful* and conventional insurance industries in Malaysia, as measured by net investment income.

TABLE 10 HERE

The combined regression model (see Table 10) further reveals that the explanatory macro-economic variables, GDP, CPI and TBR, have no statistically significant influence on the performance of the overall insurance industry in Malaysia, as measured by net contributions. In contrast, the overall net investment income model is statistically significant at the 99% confidence level, implying that net investment income is considerably influenced by changes in the explanatory variables. In the latter model, our analysis shows that within the macro-economic variables GDP influences the insurance industry in Malaysia at the 99% confidence level. The net contribution model for *Takaful*

only is insignificant while it is significant for conventional insurance companies. The combined net contribution model for both industries is insignificant. This may indicate that *Takaful* operators have a substantial influence on the overall industry.

5. Conclusion

According to the descriptive statistics, conventional insurers perform better than *Takaful* operators in terms of financial performance and managerial efficiency, as is evident from the statistical significance of the ROA and ROE ratios of the conventional insurers. Besides, the results indicate that conventional insurers maintain a relatively higher capital base than *Takaful* operators, which can benefit conventional insurers enabling them better to curb potential capital contingency than *Takaful* operators. However, *Takaful* operators have more prudent underwriting policies in place which curbs information asymmetry and minimizes the level of moral hazard by maintaining a relatively low level of claim ratios. As to solvency ratios *Takaful* operators focus more on general insurance than conventional insurers who maintain a sounder capital base. Discriminant analysis shows that there are four financial ratios namely ROE, premium to surplus (f), investment income and asset to premium that are most influential in predicting the performance levels of both industries at the 99% confidence level. The discriminant function shows that the overall performance prediction accuracy is approximately 84%. The analysis supports the above conclusions to the effect that conventional insurers perform better than *Takaful* operators in terms of both profitability and solvency ratios. Logistic regression results show that six out of seven financial ratios have high statistical significance. Premium to surplus (f), ROE and claim ratio are statistically significant at the 99% confidence level while investment income ratio, asset to premium and premium to surplus (o) are statistically significant at the 95% confidence level. Overall prediction accuracy of the logistic regression model is 90%. This indicates that logistic regression is more reliable than discriminant analysis in distinguishing the performance of the two industries.

On the other hand two of our macro-economic variables namely Gross Domestic Product and Treasury Bill Rate exercise statistical influence on the growth of conventional insurers as measured by net contribution. By contrast all our macro-economic variables have no statistical influence on the growth of *Takaful* operators as measured by net contribution. This can be attributable to *Takaful's* lower economies of scale as found by the findings of Ismail *et al*. (2011). However, net investment income, as a measure of

growth, is greatly influenced by changes in the macro-economic variables, for both *Takaful* operators and conventional insurers, which can be attributable to a relatively stable secondary market for both industries in Malaysia. Finally, given the present level of limited research in the Malaysian *Takaful* sector, future research could usefully pursue the implications of our findings for risk management in both *Takaful* and conventional insurance companies. Companies and clients alike have an investment in financial performance and stability, ultimately solvency. Within these concepts our findings direct managerial attention to the most significant metrics for *Takaful* operators and conventional insurers respectively, reflecting their relative strengths and vulnerabilities. Our findings could also usefully be tested against other countries, particularly where they differ in the stage of evolution of the insurance industries. A larger data set and more detailed ratios may emerge with evolving disclosure requirements. This should be clearly exploited.

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TABLES

Table 1: Key *Takaful* statistical indicators (Malaysia)

Indicator	2006	2007	2008	2009	2010
Takaful Operators	8	8	8	8	9
No. of agents	15,194	43,843	60,197	88,895	74,089
No. of offices	4,006	10,856	15,975	32,997	31,391
Net Cont. RM million	1,720.90	2,565.00	3,025.10	3,521.80	4,406.00
% of GNI	0.3	0.4	0.4	0.5	0.6
Family (% GNI)	0.2	0.3	0.3	0.4	0.5
General (% GNI)	0.1	0.1	0.1	0.1	0.1
Takaful total assets	6,899.00	8,818.30	10,569.40	12,445.80	14,691.10
Family assets	5,800.90	7,445.20	8,900.10	10,536.60	12,445.30
General assets	1,098.10	1,373.10	1,669.30	1,909.20	2,245.70
% of overall Ins. Ind.	5.9	6.7	7.5	7.6	8

Source: BNM *Takaful* statistics (2010)

Table 2: Key insurance statistical indicators (Malaysia)

Indicator	2006	2007	2008	2009	2010
No. of insurers L/G	8	8	7	7	6
No. of agents	n/a	117,752	113,653	116,008	122,399
No. of offices ins.	n/a	705	729	715	696
Net Prem. RM million	n/a	27,079.70	27,720.20	29,208.20	31,923.90
% of GNI	n/a	4.3	3.9	4.4	4.3
Life (% GNI)	n/a	3	2.6	3	2.9
General (% GNI)	n/a	1.3	1.3	1.4	1.4
Insurance total assets	n/a	122,414.30	130,940.90	148,638.20	166,193.60
Life assets	n/a	102,502.90	109,372.70	125,824.80	141,456.30
General assets	n/a	19,911.40	21,568.20	22,813.40	24,737.30
% of overall Ins. Ind.	n/a	4.9	5.1	5.4	5.5

Source: BNM insurance statistics (2010)

Table 3: List of predictor variables used in building the models

Variables
Return on assets (ROA)*
Return on equity (ROE)*
Claim expenses to net income*
Investment income to average invested assets
Investment income ratio*
Total assets to total net contributions or premiums*
Premium to surplus ratio (o)*
Premium to surplus ratio (f)*
Admin expenses to premiums written
Net assets to net premiums written
Operating expenses to average assets
Operating income to total assets
Operating expenses to operating income

***** Variables finally selected in building the models

Table 4: Descriptive statistics of the financial ratios

Variables	**N**		**Mean**		**Std. deviation**		**Std. error**		**t-test for equality of means**	
	Takaful	Conventional insurance	*Takaful*	Conventional insurance	*Takaful*	Conventional insurance	*Takaful*	Conventional insurance	t-value	*p*-value
Profitability ratios										
Investment income ratio	28	30	.05	.04	.056	.098	.011	.018	.733	.467
ROA	27	29	-.001	.01	.032	.006	.006	.001	-2.395	.024
ROE	27	29	.01	.35	.172	.488	.033	.091	-3.504	.001
Claim ratio	27	23	.49	.63	.363	.077	.070	.016	-1.996	.055
Solvency ratios										
Premium to surplus ratio (f)	27	29	2.0	4.0	1.057	6.602	.203	1.226	-1.439	.161
Premium to surplus ratio (o)	28	30	34.0	4.0	115.01	13.038	22.133	2.380	1.381	.079
Assets to premium ratio	27	29	4.3	6.0	3.091	2.864	.595	.532	-2.203	.032

Table 5: Stepwise discriminant analysis

Variable	Wilks' Lambda	Chi^2	Unstandardized Canonical Coefficients	Exact F		
				Statistic	DF	*P*-value
Investment income ratio	0.883	-	-21.695	6.366	1	0.015
Assets to premium	0.760	-	0.235	7.404	2	0.002
Premium to surplus (f)	0.660	-	0.139	7.906	3	0.000
ROE	0.588	-	1.372	7.870	4	0.000
Overall model	0.588	24.396	0.642 (correlation)	-	4	0.000
Group centroids (insurance)	-	-	0.888	-	-	-
(*Takaful*)	-	-	-0.756	-	-	-

Table 6: Classification results for discriminant analysis and logistic regression

Actual group	Predicted group			
	Takaful (1)	Conventional insurance (0)	Total	%
Discriminant analysis				
Takaful (1)	22	5	27	81.48
Conventional insurance (0)	4	25	29	86.21
Total			56	83.93
Logistic regression				
Takaful (1)	24	3	27	88.89
Conventional insurance (0)	2	21	23	91.30
Total			50	90.00

Table 7: Stepwise logistic regression model

Variable	Estimates	Change in -2 log likelihood	DF	*P*-value
Investment income ratio	39.064	4.920	1	0.027
Assets to premium	-0.518	5.712	1	0.017
Premium to surplus (f)	-0.447	12.707	1	0.000
ROE	-25.556	22.075	1	0.000
Claim ratio	-10.985	14.566	1	0.000
Premium to surplus (o)	0.064	4.999	1	0.025
Overall model	-2 log likelihood	Cox & Snell R^2	Nagelkerke R^2	
	25.569	0.580	0.7760	0.000

Table 8: Net contributions regression model

	Takaful			Conventional insurance		
Variable	B	T	*P*-value	B	T	*P*-value
Constant	-201.231	-1.554	0.137	60.725	1.789	0.087
GDP	5.068	0.520	0.609	5.190	1.948	0.064
CPI	-10.205	-.248	0.673	2.712	0.475	0.639
TBR	86.966	1.645	0.116	-25.176	-1.805	0.084
Overall model	R^2	F	-	R^2	F	-
	0.136	0.999	0.415	0.264	1.501	0.054

Notation: GDP: Gross Domestic Product; CPI: Consumer Price Index and TBR: Treasury Bill Rate.

Table 9: Net investment income regression models

	Takaful			Conventional insurance		
Variable	B	T	*P*-value	B	T	*P*-value
Constant	-184.411	-2.038	0.056	129.669	.948	0.353
GDP	12.870	1.890	0.074	32.298	2.992	0.006
CPI	-9.213	-0.553	0.586	-30.018	-1.238	0.228
TBR	79.518	2.152	0.044	13.901	0.248	0.806
Overall model	R^2	F	-	R^2	F	-
	0.217	1.756	0.049	0.389	5.084	0.007

Notation: GDP: Gross Domestic Product; CPI: Consumer Price Index and TBR: Treasury Bill Rate.

Table 10: Combined regression model

	Net contributions			Net investment income		
Variable	B	t	*P*-value	B	t	*P*-value
Constant	-64.848	-1.018	0.314	-23.888	-0.260	0.796
GDP	0.199	0.040	0.968	22.408	3.155	0.003
CPI	-1.419	-0.127	0.900	-19.162	-1.156	0.253
TBR	28.767	1.103	0.276	45.313	1.206	0.234
Overall model	R^2	F	-	R^2	F	-
	0.039	0.628	0.601	0.210	4.174	0.010

Notation: GDP: Gross Domestic Product; CPI: Consumer Price Index and TBR: Treasury Bill Rate.